mixed gases. Several experiments of this nature are described, and others suggested for future trial. Various theoretical views, arising from this train of inquiry, are then discussed; particularly with reference to the contact theory, with which the author conceives that the action of the gas battery is not reconcileable; and also to the source of the caloric evolved during voltaic action, which he is strongly inclined to think is in the battery itself.

2. A paper was also read, entitled "Contributions to Terrestrial Magnetism." No. IV. By Lieut.-Colonel Edward Sabine, R.A., F.R.S.

In the present number of these contributions, the author resumes the consideration of Captain Sir Edward Belcher's magnetic observations, of which the first portion, namely, that of the stations on the north-west coast of America and its adjacent islands, was discussed in No. 2. The return to England of H.M.S. Sulphur by the route of the Pacific Ocean, and her detention for some months in the China Seas, have enabled Sir Edward Belcher to add magnetic determinations at thirty-two stations to those at the twenty-nine stations previously recorded.

The author first describes the experiments which he instituted with the different needles employed by Captain Sir Edward Belcher for determining the coefficient to be employed in the formula for the temperature corrections; and takes this opportunity of noticing the singular fact that, in needles made of a particular species of Russian steel, this coefficient is negative; that is, in these needles, an increase of temperature increases the magnetic power. M. Adolphe Erman describes this particular kind of steel as consisting of alternate very thin layers of soft iron and of steel, so that when heated the soft iron layers increase their magnetic intensity and the steel layers diminish theirs.

He next considers the more important question of the steadiness with which the needles may have maintained their magnetic condition. By intercomparison of the results obtained at various stations with the different needles employed, he assigns corrections to be applied to the determination of the magnetic force deduced from the observed times of vibration. The magnetic force thus corrected, from the observations with each of the needles employed at the various stations visited by Sir Edward Belcher, is then given in a general table of results. The observations of the inclination of the needle are given in another table; and a third table contains the determination of the declination and inclination of the needle, the horizontal and total magnetic intensity deduced from the observations at thirty-two stations, of which the latitudes and longitudes are given in the same table, together with the dates of observation,